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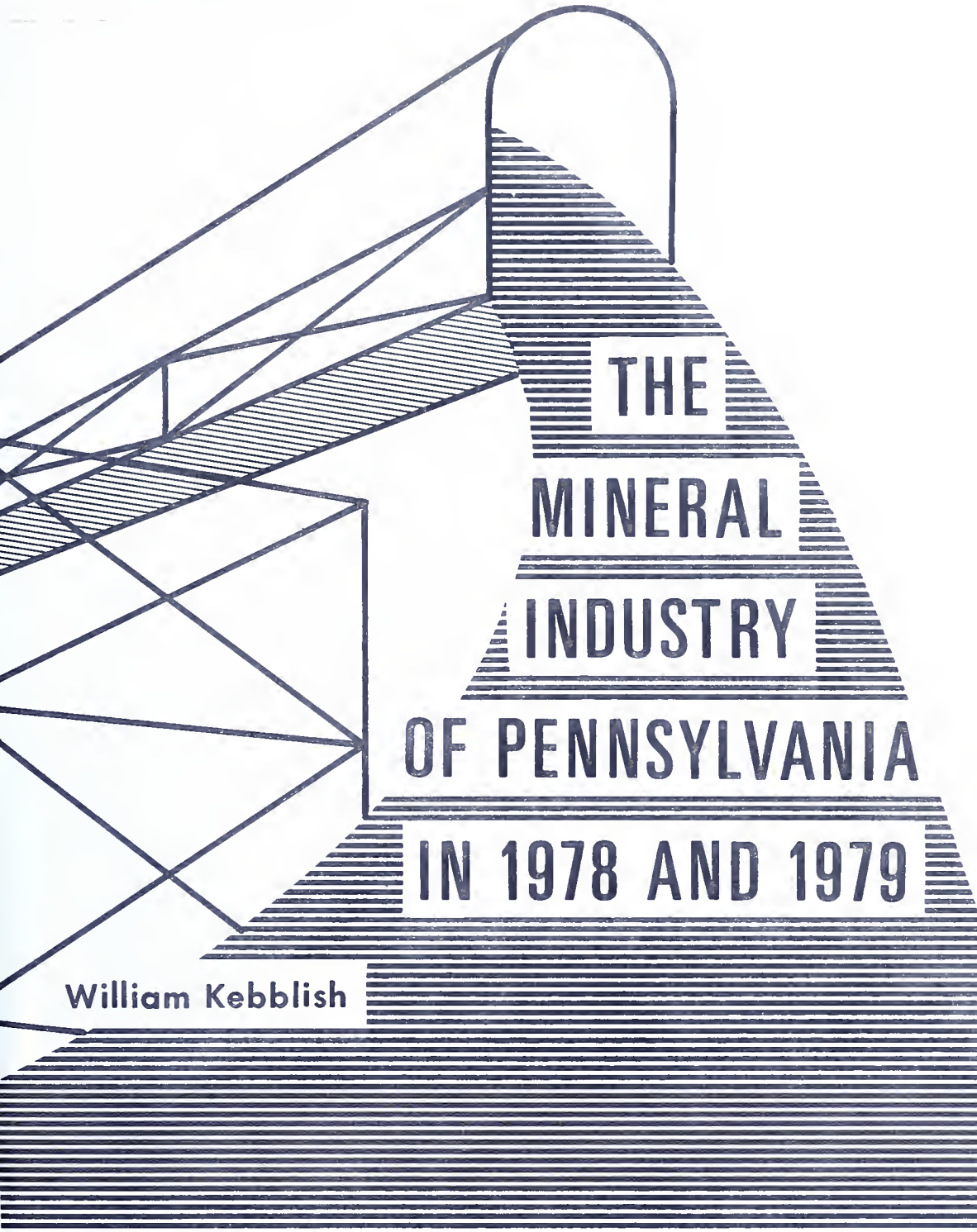

THE MINERAL INDUSTRY OF PENNSYLVANIA IN 1978 AND 1979

William Kebblish

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
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UNITED STATES DEPARTMENT OF THE INTERIOR • James G. Watt, Secretary

BUREAU OF MINES

This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Pennsylvania

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, to collect information covering all nonfuel mineral production from mines and quarries.

By William Kebblish[1]

The value of Pennsylvania's mineral production, excluding fuels, was $629.5 million in 1978 and $722.6 million in 1979. Production value increased for masonry and portland cement, clays, lime, peat, and crushed stone, compared with production values for 1977; but, value declined in 1978 for dimension stone and zinc, rebounding to higher levels in 1979.

Nationally, Pennsylvania ranked high in mineral production and led in the production of masonry cement and cadmium. The State was second in the production of lime, pig iron, finished iron oxide pigments and other iron oxide materials (both natural and synthetic), slag, and stone; third in portland cement output; fifth in dimension stone output; and seventh in the production of zinc, crude mica, and clay and shale. Leading producing counties were York (cement and stone), Butler (lime, cement, and stone), Huntingdon (stone), and Armstrong (sand and gravel, clays, and stone).

Trends and Developments.—At the end of 1978, the Environmental Protection Agency (EPA) drafted air regulations requiring dry emission-control systems for certain mineral-processing plants. The proposed rules would apply to new, modified, or rebuilt plants that process nonmetals, with only a minimal impact on existing plants. The dry emission-control systems, better known as baghouses, would be used primarily in the stone, sand and gravel, and cement industries, all of which are important industries in Pennsylvania.

The environmental effects of dredging for sand and gravel in the Allegheny River became an issue in 1978 and 1979 and resulted in hearings held by the U.S. Army Corps of Engineers. As a result, the Corps of Engineers requested EPA to prepare an environmental impact statement on dredging of the Allegheny. The Corps also withheld action on new dredging permits, but existing permits remained valid.

United States Steel Corp. announced plans to construct a new steel mill on Lake Erie at the Pennsylvania-Ohio border. It was expected that the $3 to $4 billion plant would be completed in 8 years, providing over 8,000 jobs. Steel production was projected at over 6 million short tons annually, or about 17% of the firm's existing capacity. Pennsylvania authorities had no objections to the proposed plant, and the application for construction awaited approval from the Corps of Engineers and EPA.

Planned improvements by steel companies in the Pittsburgh area included four electric furnaces, two by Jones & Laughlin Steel Corp. and two by Crucible Alloys. Wheeling-Pittsburgh Steel Corp. planned to construct a rail mill, and Monongahela Steel Corp. planned to build a reinforcing bar and rod mill. In the Johnstown area, Bethlehem Steel Corp. planned to install a new electric melt shop, and Abex Corp. planned to produce railroad wheels.

Legislation and Government Programs.—The Pennsylvania General Assembly passed five bills pertaining to the min-

Table 1.—Nonfuel mineral production in Pennsylvania[1]

Mineral	1977 Quantity	1977 Value (thousands)	1978 Quantity	1978 Value (thousands)	1979 Quantity	1979 Value (thousands)
Cement:						
Masonry thousand short tons	411	$19,927	445	$22,803	415	$24,177
Portland do	6,162	196,443	6,750	228,568	6,508	259,756
Clays[2] do	2,304	13,075	2,571	18,175	2,468	20,099
Gem stones	NA	10	--	--	--	--
Lime thousand short tons	2,007	72,591	2,126	83,869	2,153	96,569
Mica (scrap) do	1	W	2	W	4	W
Peat do	16	353	23	435	24	531
Sand and gravel do	18,846	52,578	[3]19,135	[3]51,243	20,150	71,740
Stone:						
Crushed do	63,522	163,652	69,041	194,518	71,730	224,908
Dimension do	66	5,362	70	5,215	77	5,961
Zinc (recoverable content of ores, etc.) metric tons	20,706	15,703	19,099	13,053	21,447	17,636
Combined value of clays (kaolin), copper (1977), iron ore (1977), sand and gravel (industrial, 1978), tripoli, and values indicated by symbol W	XX	20,002	XX	11,637	XX	1,237
Total	XX	559,696	XX	629,516	XX	722,614

NA Not available. W Withheld to avoid disclosing company proprietary data; value included in "Combined value" figure. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Excludes kaolin; value included in "Combined value" figure.

[3]Excludes industrial sand; value included in "Combined value" figure.

ing industry that were signed into law during 1978 and 1979. Act 1978-5 specified duties of a blaster; Act 1978-314 regulated construction and storage in manmade caverns; Act 1978-98 provided additional land near the Cornwall Furnace to the Pennsylvania Historical and Museum Commission; and Act 1978-333 designated the Schuylkill River as a scenic river, thereby precluding mineral extraction along the river corridor.

Mineral extraction was also banned northeast of Stroudsburg along a section of the upper Delaware River, which forms the boundary between Pennsylvania and New Jersey. This region was declared a wild and scenic river through Federal legislation. Previously, the Corps of Engineers had planned to construct the Tocks Island Dam in this region, but these plans were abandoned in 1978. Federal legislation transferred land acquired for the dam to the National Park Service for use as a recreational area.

Under the Coastal Zone Management Act of 1972, Pennsylvania qualified as a coastal State, owing to its 63-mile shoreline on Lake Erie and the 55-mile segment of the tidal Delaware River that is within the State in the Philadelphia area. A technical plan drafted by the State in 1978 not only provided for the protection and development of coastal resources, but also established guidelines for the mineral-extraction industries. The State Coastal Program must be approved by the Governor and the U.S. Department of Commerce before the State can receive Federal funds for administration of the program.

Legislation establishing the Coal and Clay Mine Subsidence Insurance Fund passed in 1971 and was amended in 1979 for clarity with respect to insurance policies. New policies sold in 1978 and 1979 totaled slightly over 3,000, bringing the total number of policies sold to 11,606. Claims paid to 85 policyholders in 1978 and 1979 amounted to $570,000.

The State's Department of Environmental Resources implemented performance standards as required by the Federal Surface Mining Control Act of 1977, reviewed current reclamation laws, and developed a State surface mining control program that was expected to lead to primacy under the Federal Act. The Pennsylvania program was expected to be submitted to the U.S. Office of Surface Mining for approval in 1980.

Employment.—In 1978, approximately 10,000 people were employed in Pennsylvania's metal and nonmetal mining industry. The stone industry employed slightly more than 79% of the total. The sand and gravel industry was the next largest of the mining industry's employers, with approximately 10% of the total; and 8% of the mineworkers were employed in other nonmetal industries, such as clay shale, magnesite, and peat operations. The metal industry employed the remaining 3% of the State's mining work force, mostly in the eastern part of the State.

Table 2.—Value of nonfuel mineral production in Pennsylvania, by county[1]

(Thousands)

County	1977	1978	Minerals produced in 1978 in order of value
Adams	W	W	Stone, lime, clays, mica.
Allegheny	$25,455	W	Cement, clays, sand and gravel, stone.
Armstrong	9,667	$10,941	Sand and gravel, clays, stone.
Beaver	W	7,777	Sand and gravel, clays.
Bedford	2,334	2,438	Stone, sand and gravel.
Berks	47,702	W	Cement, stone, clays, sand and gravel.
Blair	W	W	Stone, sand and gravel.
Bradford	W	W	Sand and gravel, stone.
Bucks	W	W	Stone, sand and gravel, clays.
Butler	26,089	32,651	Lime, cement, stone, sand and gravel, clays.
Cambria	W	W	Stone.
Cameron	W	W	Sand and gravel.
Carbon	W	W	Sand and gravel, stone.
Centre	W	W	Lime, stone, clays.
Chester	W	W	Stone, lime, clays.
Clarion	W	W	Stone.
Clearfield	W	W	Clays, stone, sand and gravel
Clinton	W	W	Stone, clays.
Columbia	W	W	Sand and gravel, stone.
Crawford	1,549	1,210	Sand and gravel.
Cumberland	4,544	W	Stone, sand and gravel, clays.
Dauphin	W	W	Stone, sand and gravel.
Delaware	W	W	Stone.
Elk	W	W	Do.
Erie	4,591	4,616	Sand and gravel, peat.
Fayette	W	5,545	Stone, clays.
Forest	W	W	Sand and gravel, stone.
Franklin	W	W	Stone, sand and gravel.
Fulton	W	W	Do.
Huntingdon	W	W	Stone.
Indiana	W	--	
Jefferson	W	W	Clays, stone.
Juanita	--	W	Stone.
Lackawanna	W	905	Stone, sand and gravel, peat.
Lancaster	W	W	Stone, clays, sand and gravel.
Lawrence	W	W	Cement, stone, sand and gravel, clays, peat.
Lebanon	W	W	Lime, stone.
Lehigh	W	W	Cement, zinc, stone.
Luzerne	5,041	W	Stone, sand and gravel, peat.
Lycoming	W	W	Stone, sand and gravel.
McKean	W	W	Clays, stone.
Mercer	W	W	Sand and gravel, stone.
Mifflin	W	W	Stone, sand and gravel, lime.
Monroe	W	W	Stone, sand and gravel, clays, peat.
Montgomery	W	W	Stone, lime, cement, clays.
Montour	W	W	Stone.
Northampton	W	W	Cement, stone, sand and gravel.
Northumberland	W	W	Stone, sand and gravel, clays, tripoli.
Perry	W	W	Stone.
Pike	W	W	Stone, sand and gravel, peat.
Potter	36	W	Stone.
Schuylkill	1,192	1,431	Stone, sand and gravel.
Snyder	W	W	Stone.
Somerset	W	3,684	Stone, clays, sand and gravel.
Susquehanna	1,122	W	Stone.
Tioga	1,468	1,106	Stone, sand and gravel.
Union	W	W	Stone, clays.
Venango	1,137	1,120	Sand and gravel.
Warren	1,365	1,687	Do.
Wayne	2,010	W	Stone, sand and gravel.
Westmoreland	W	W	Do.
Wyoming	W	W	Sand and gravel.
York	47,632	52,480	Cement, stone, lime, sand and gravel, clays.
Undistributed[2]	376,763	501,921	
Total[3]	559,696	629,516	

W Withheld to avoid disclosing company proprietary data; included with "Undistributed."

[1]Greene, Philadelphia, Sullivan, and Washington Counties are not listed because no nonfuel mineral production was reported.

[2]Includes gem stones and values indicated by symbol W.

[3]Data may not add to totals shown because of independent rounding.

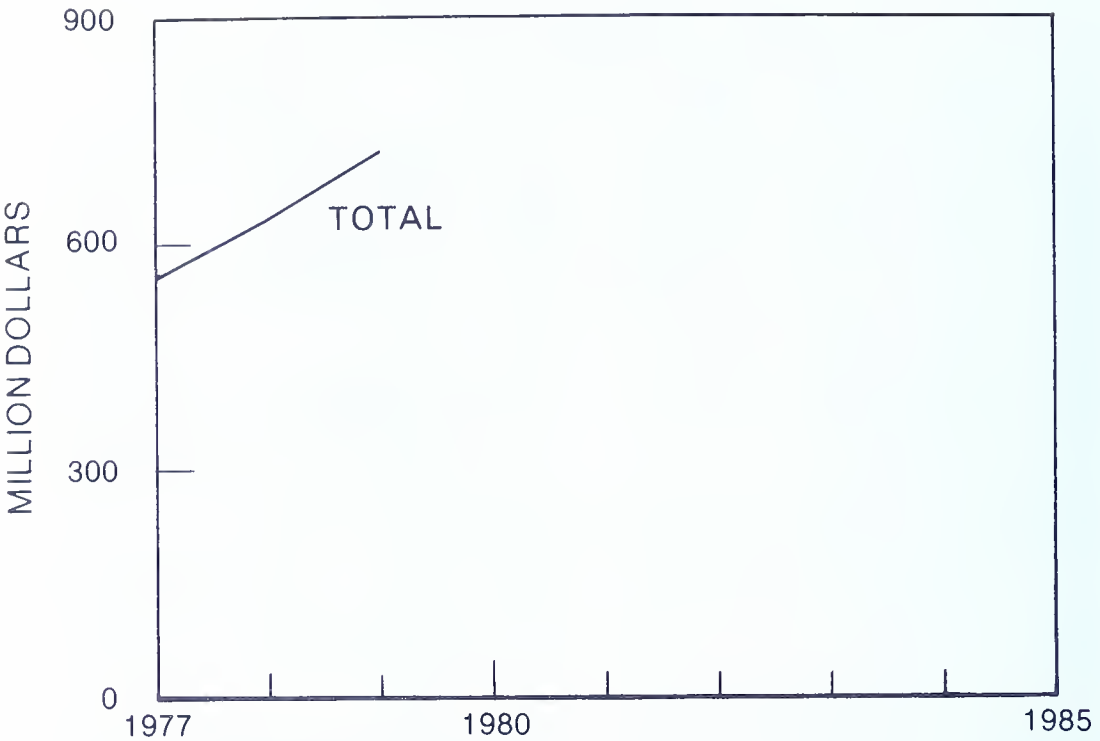

Figure 1.—Total value of nonfuel mineral production in Pennsylvania.

Table 3.—Indicators of Pennsylvania business activity

		1977	1978	1979[p]	1978-79 percent change
Employment and labor force, annual average:					
Total civilian labor force	thousands	5,168.0	5,255.0	5,296.0	+0.8
Unemployment	do	398.0	364 0	366.0	+10.5
Employment (nonagricultural):					
Mining[1]	do	48.0	46.8	52.0	+11.1
Manufacturing	do	1,341.9	1,369.2	1,389.8	+1.5
Contract construction	do	183.9	199.0	205.8	+3.4
Transportation and public utilities	do	261.6	267.2	273.1	+2.2
Wholesale and retail trade	do	938.9	983.7	990.0	+.6
Finance, insurance, real estate	do	217.5	226.6	235.4	+3.9
Services	do	862.5	907.2	961.8	+6.0
Government	do	710.9	724.9	722.7	-.3
Total nonagricultural employment[1]	do	4,565.2	4,724.6	4,830.6	+2.2
Personal income:					
Total	millions	$82,579.0	$90,991.0	$100,400.0	+10.3
Per capita		$7,000.0	$7,744.0	$8,559.0	+10.5
Construction activity:					
Number of private and public residential units authorized		50,298.0	[2]53,985.0	43,795.0	-18.9
Value of nonresidential construction	millions	$464.4	$570.2	$686.4	+20.4
Value of State road contract awards	do	$150.0	$60.0	$105.5	+75.8
Shipments of portland and masonry cement to and within the State	thousand short tons	3,126.0	3,227.0	3,067.0	-5.0
Nonfuel mineral production value:					
Total crude mineral value	millions	$559.7	$629.5	$722.6	+14.8
Value per capita, resident population		$47.0	$54.0	$62.0	+14.8
Value per square mile		$12,346.0	$13,886.0	$15,940.0	+14.8

[p]Preliminary.
[1]Includes coal (anthracite and bituminous), gas, and oil extraction.
[2]Series revised in 1978, data not comparable with those of prior years.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

REVIEW BY NONFUEL MINERAL COMMODITIES

NONMETALS

Cement.—Nationally, Pennsylvania ranked first in 1979 in the production of masonry cement and third, behind California and Texas, in the production and production value of portland cement. Masonry cement was produced at 17 plants in 8 counties. Compared with the data for 1978, shipments in 1979 decreased, but value increased.

Portland cement was produced at 17 plants in 7 counties. Shipments and production value decreased in 1979, compared with the data for 1978, owing to a decline in the housing and construction industries. The leading producing counties were Northampton and Lawrence. Other producing counties included Allegheny, Berks, Butler, Lehigh, Montgomery, and York.

Major producers of portland and masonry cement included Amcord, Inc., Coplay Cement Manufacturing Co., Medusa Corp., National Gypsum Co., and U.S. Steel Corp. There has been little change in use patterns during recent years. Of the 6.5 million short tons of cement sold in 1979, approximately 54% was used by ready-mix companies, 28% was used in concrete products, 12% was used by building supply dealers, and the remaining 6% was used for other purposes.

Clays.—During 1978, 36 companies operated 85 clay and shale mines in 23 of Pennsylvania's 67 counties. The industry's structure was similar in 1979, but the production of clay and shale decreased in comparison with that of 1978. Clearfield County, with 12 operations, was the leading producing county. Other major counties, in descending order of production, were Lawrence, Berks, Beaver, York, and Armstrong.

The average unit value of clay and shale increased to $7.42 per short ton in 1978, and unit values continued to increase in 1979. Clay and shale were used mainly in the manufacture of face brick, firebrick, cements, flue linings, refractory products, and sewer pipe. Leading producers were Glen-Gery Corp., Medusa Corp., Hanley Co., and Resco Products, Inc.

Table 4.—Pennsylvania: Clays sold or used by producers, by use[1]

(Short tons)

Use	1977	1978	1979
Common brick	249,749	345,600	335,527
Face brick	957,680	1,135,311	1,091,641
Firebrick, block and shapes	473,438	502,652	581,107
Flue linings	162,993	136,077	70,673
Lightweight aggregates	10,700	W	W
Mortar and cement, refractory	62,525	65,754	81,012
Portland and other cements	162,256	184,168	159,604
Tile: Drain, quarry, and structural	58,149	53,100	51,557
Other uses[2]	82,720	59,450	45,897
Exports: Mortar, cement, other refractories	84,180	88,916	50,860
Total	2,304,390	2,571,028	2,467,878

W Withheld to avoid disclosing company proprietary data; included with "Other uses."
[1]Excludes kaolin.
[2]Includes fertilizers, pottery, roofing granules, sewer pipe, terra cotta, and data indicated by symbol W.

Graphite.—Airco Speer Carbon Co. and Stackpole Carbon Co. (both in Elk County), and Charles Pfizer & Co., Inc. (in Northampton County), produced synthetic graphite for use in the manufacture of anodes, graphite shapes, crucibles and vessels, and electric-motor brushes.

Gypsum.—Imported gypsum was calcined by United States Gypsum Co. in Philadelphia County. Calcined gypsum was used mainly in the manufacture of prefabricated products, such as regular wallboard, type-X wallboard, and lath. These products were used extensively in home and commercial construction.

Iodine.—Whitmoyer Laboratories, Inc., in Lebanon County, and West-Agro Chemical, Inc., in Washington County, imported crude iodine from other States, which was used in the manufacture of pharmaceuticals, catalysts, and sanitation products.

Table 5.—Pennsylvania: Lime sold or used by producers, by use

Use	1977		1978		1979	
	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)
Steel, BOF	979,800	$34,971	1,041,750	$39,159	900,987	$40,411
Steel, electric	163,800	5,845	157,694	5,928	285,871	12,822
Sewage treatment	120,500	4,300	144,598	5,435	193,587	8,683
Water purification	255,100	9,106	245,714	9,236	185,710	8,329
Mason's lime	75,250	2,627	81,739	3,636	83,306	3,736
Steel, open-hearth	W	W	59,656	2,242	80,976	3,632
Acid mine water	W	W	W	W	69,606	3,122
Agriculture	23,710	930	23,869	1,052	23,154	1,038
Paper and pulp	38,900	1,389	21,609	812	20,504	920
Tanning	6,968	249	9,423	354	10,169	456
Petroleum refining	4,338	155	W	W	W	W
Soil stabilization	1,564	55	W	W	W	W
Other uses[1]	336,900	12,963	340,181	16,015	299,191	13,420
Total[2]	2,007,000	72,591	2,126,200	83,869	2,153,061	96,569

W Withheld to avoid disclosing company proprietary data; included with "Other uses."
[1]Includes alkalies, construction lime (1979), explosives (1977-78), finishing lime (1977-78), glass, oil well drilling (1979), ore concentration, other chemical and industrial uses, other metallurgical uses (1978-79), paint, petrochemicals, refractory dolomite (1977-78), refractory lime (1979), rubber (1979), sand-lime brick, silica brick (1978-79), sugar refining (1977-78), sulfur removal (1979), wire drawing, and uses indicated by symbol W.
[2]Data may not add to totals shown because of independent rounding.

Lime.—Pennsylvania ranked second nationally, behind Ohio, in the production and production value of lime. Within the State, 10 plants were operated by 8 companies in 8 counties. Centre was the leading lime-producing county in the State, with three plants and 30% of the total production and production value. The other seven producing counties were, in alphabetical order, Adams, Butler, Chester, Lebanon, Mifflin, Montgomery, and York.

Domtar, Inc., in Bellefonte, Centre County, announced plans to spend $3.5 million to expand the capacity of its limestone plant near Bellefonte. The project plans included equipment modernization and the installation of pollution-control devices. The plant's production of quicklime was expected to increase by 120,000 short tons annually.

In 1978 and 1979, quicklime accounted for over 80% of the total lime produced in the State, and hydrated lime accounted for the remainder. The steel industry was the largest consumer of lime, and lesser amounts were used for water purification, sewage treatment, and agricultural purposes.

Mica.—Gross Minerals Corp., located in Adams County, produced scrap and flake mica by beneficiating schists and pegmatites. The product was used in mica paper and other electrical insulating materials.

Mullite.—A. P. Green Refractories, Philadelphia County, produced synthetic mullite by heating aluminum silicates to high temperatures. Mullite is a heat-resistant material used in furnace linings, refractories, and glass products. The production and production value of synthetic mullite in 1979 increased slightly, compared with those of 1978.

Peat.—Peat production in 1979 increased slightly, compared with those of 1978, with all production coming from the northeast and northwest part of the State. Six operations were located in Luzerne County, three were in Lackawanna County, and one each was located in Erie, Lawrence, and Pike Counties. Major producers were Corry Peat Products, Gouldsboro-Wayne Peat Co. Lake Benton Peat Moss, and Valliant Enterprises. Virtually all peat was used for agricultural and horticultural purposes. Moss peat comprised 7% of Pennsylvania's total peat production, reed-sedge comprised 57%, and humus accounted for the remaining 36%.

Perlite.—Crude perlite was shipped into six counties in the State and expanded at six plants by five companies. The total amount of expanded perlite sold or used in 1979 was 34,300 short tons valued at $3.9 million, reflecting a slight decrease in both production and production value, compared with those of 1978. Plants in western Pennsylvania were the Therm-O-Rock Div. of Allied Block Chemicals Co., located at New Eagle, Washington County, which began operating in 1978; and Perlite Manufacturing Co., located at Carnegie, Allegheny County. Producers in eastern Pennsylvania included Armstrong Cork Co., United States Gypsum Co., and Pennsylvania Perlite Corp. Perlite was used in plaster, cement aggregates, and for horticultural purposes. Minor uses included low-temperature insulation, fillers, foundry applications, insulat-

ing board, and bonding mortars.

Pyrophyllite.—Pyrophyllite was imported into the State and processed by American Olean Tile Co., Berks County. Pyrophyllite, a natural hydrous aluminum silicate found in metamorphic rocks, was used in ceramics and slate pencils. It is also a substitute for talc and is commonly termed "pencil stone." Other uses included cosmetics, insecticides, paint, and paper and rubber products.

Sand and Gravel.—Construction sand and gravel was produced by 128 companies in 39 of the State's 67 counties. Although production was approximately the same in 1978 and 1979, the value of production for 1979 increased more than 17% because of inflationary pressures. Beaver was the leading producing county, with 12% of the State's sand and gravel production, and was followed by Bucks, Armstrong, and Erie Counties. Construction sand and gravel was used primarily for concrete and asphalt aggregate, road base, and fill. Other uses were in concrete products, plaster, gunite, and for snow and ice control and railroad ballast. The 1979 unit value per short ton averaged $3.16, compared with $2.68 in 1978.

Nearly 82% of the State's construction sand and gravel was shipped to market by truck, 11% was shipped by water, and 1% was shipped by other means; the remainder was used at the originating plant sites. Leading producers were Davison Sand & Gravel Co., Dravo Corp., Erie Sand Steamship Co., and Warner Co.

Industrial sand was produced by McCrady Inc., Allegheny County, and Penn Glass Sand, Venango County. General uses were in glass manufacture, ferrous foundry operations, nonferrous operations, some chemical and metallurgical processes, and as fillers in manufactured products. Industrial sand data were withheld to avoid disclosing individual company proprietary data.

Table 6.—Pennsylvania: Construction sand and gravel sold or used, by major use category

Use	1977			1978			1979		
	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton
Concrete aggregate	6,290	$16,242	$2.58	7,803	$21,601	$2.77	7,718	$26,405	$3.44
Plaster and gunite sands	NA	NA	NA	W	W	3.74	552	1,851	3.35
Concrete products	1,500	5,052	3.38	1,259	4,303	3.42	1,317	5,174	3.93
Asphaltic concrete	3,446	8,788	2.55	2,989	7,882	2.64	2,336	7,047	3.02
Roadbase and coverings	4,258	10,878	2.55	4,475	12,472	2.79	4,728	14,233	3.01
Fill	1,782	2,252	1.26	1,926	2,778	1.44	1,483	2,529	1.71
Snow and ice control	NA	NA	NA	197	598	3.04	245	802	3.27
Railroad ballast	45	126	2.76	47	129	2.71	45	126	2.76
Other uses	405	1,135	2.80	438	1,480	3.38	622	1,864	3.00
Total[1] or average	17,727	44,482	2.51	19,135	51,243	2.68	19,047	60,031	3.15

NA Not available. W Withheld to avoid disclosing company proprietary data; included in "Other uses."
[1]Data may not add to totals shown because of independent rounding.

Table 7.—Pennsylvania: Sand and gravel sold or used by producers, by use

	1977			1978			1979		
	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton
Construction:									
Sand	8,899	$22,808	$2.56	9,622	$25,721	$2.67	9,787	$30,312	$3.10
Gravel	8,828	21,674	2.46	9,513	25,522	2.68	9,261	29,718	3.21
Total[1] or average	17,727	44,482	2.51	19,135	51,243	2.68	19,047	60,031	3.15
Industrial sand	1,120	8,095	7.23	W	W	W	1,102	11,709	10.62
Grand total[1] or average	18,846	52,578	2.79	W	W	W	20,150	71,740	3.57

W Withheld to avoid disclosing company proprietary data.
[1]Data may not add to totals shown because of independent rounding.

Table 8.—Pennsylvania: Construction sand and gravel sold or used, by county

(Thousand short tons and thousand dollars)

County	1977			1978			1979		
	Quantity	Value	Number of companies	Quantity	Value	Number of companies	Quantity	Value	Number of companies
Allegheny	W	W	1	W	W	1	W	W	1
Armstrong	1,945	6,891	4	2,161	7,454	3	2,308	8,820	3
Beaver	2,144	5,028	4	2,577	6,593	4	2,435	11,097	4
Bedford	3	7	1	3	7	1	3	7	1
Berks	W	405	2	W	W	2	53	79	1
Blair	W	W	1	11	W	1	W	W	1
Bradford	W	W	2	306	850	4	373	1,017	6
Bucks	1,519	2,760	4	2,511	4,772	3	2,955	7,443	3
Butler	1	W	2	293	W	2	293	W	2
Cameron	W	W	1	W	W	1	W	W	1
Carbon	W	W	2	460	1,391	3	408	1,374	3
Clarion	--	--	--	--	--	--	W	W	1
Clearfield	W	W	--	W	W	1	W	W	1
Clinton	W	W	1	--	--	--	--	--	--
Columbia	300	525	1	W	W	2	W	W	2
Crawford	763	1,549	7	560	1,210	7	335	917	8
Cumberland	262	753	3	223	801	3	W	470	2
Dauphin	W	W	1	W	W	1	W	W	1
Erie	2,077	4,528	15	2,083	4,566	16	1,907	4,584	15
Forest	W	W	2	W	W	2	W	W	2
Franklin	W	W	1	W	W	1	W	W	1
Fulton	W	W	1	W	W	1	W	W	1
Huntingdon	W	W	1	--	--	--	W	W	1
Lackawanna	100	175	1	W	W	2	W	W	2
Lancaster	W	W	2	98	371	1	98	371	1
Lawrence	727	1,934	9	649	1,982	9	622	2,118	9
Luzerne	900	2,238	5	898	2,684	6	949	2,578	8
Lycoming	W	W	1	W	W	1	W	W	1
Mercer	443	965	3	552	1,219	6	662	1,572	6
Mifflin	W	W	1	W	W	1	W	W	1
Monroe	440	860	5	319	540	4	223	509	4
Northampton	W	W	2	W	W	1	W	W	2
Northumberland	238	707	1	247	823	1	248	871	1
Philadelphia	--	--	--	--	--	--	W	W	1
Pike	W	W	2	149	441	3	248	639	4
Schuylkill	74	299	1	70	474	1	W	W	1
Somerset	W	W	1	W	59	1	12	41	1
Susquehanna	--	--	--	--	--	--	W	W	1
Tioga	410	577	5	332	461	4	182	199	3
Venango	509	1,137	7	501	1,120	6	436	889	5
Warren	608	1,365	13	644	1,687	9	481	1,359	10
Wayne	292	738	3	W	W	2	137	338	3
Westmoreland	W	W	1	W	W	1	W	W	1
Wyoming	W	W	2	W	W	2	W	W	2
York	W	W	2	W	W	2	W	W	2
Undistributed	3,971	11,041	--	3,488	11,738	--	3,679	12,739	--
Total	17,727	44,482	124	19,135	51,243	122	19,047	60,031	130

W Withheld to avoid disclosing company proprietary data, included in "Undistributed."

Slag.—Iron and Steel Nationally, Pennsylvania was second, behind Ohio, in slag production. Slag is a byproduct of the steelmaking process. Total slag produced in 1979 amounted to 7.3 million short tons valued at $27.5 million. Production increased nearly 6% in value over that of 1978, but decreased nearly 9% in quantity owing to a decrease in steel production. Approximately 83% of the total slag produced was blast furnace slag, and the remaining 17% was iron and steel slag.

Types of blast furnace slag that were produced included air-cooled, expanded, and granulated. Major uses of air-cooled slag were for asphalt and concrete aggregate and as a road base material. Expanded slag was used in concrete products, and granulated slag was used for road base material, fill, and cement manufacture. Steel slag was used mainly for road base material.

Leading sellers of slag were Duquesne Slag Products Co., Warner Co., Bethlehem Mines Corp., Standard Slag Co., and Dunbar Slag Co.

Stone.—Pennsylvania led the Nation in the value of total stone produced, but ranked second to Texas in quantity. The State's 254 operations, 227 of which produced crushed stone products, were located in 55 of the State's 67 counties. Northampton County led with 17 quarries, Bucks and Lancaster Counties each had 16 quarries, and Berks County had 15. The 12 largest quarries had a combined production of more than 26% of the State's total; the 57 smallest accounted for less than 0.5% of the total. The unit value for all categories of crushed

stone in 1978 was $2.90 per short ton. The highest unit value was that of crushed granite, at $4.82 per short ton.

During 1978 and 1979, approximately 85% of the crushed stone was shipped to market by truck, 5% was shipped by rail, and 10% was shipped by water. Major crushed stone producers were Bethlehem Steel Corp., New Enterprise Stone & Lime Co., Inc., and Warner Co.

In 1978 and 1979, Pennsylvania ranked fifth nationally, behind Georgia, Indiana, Ohio, and Vermont, in dimension stone production, with nearly 75,000 short tons of output valued in excess of $5 million. Stone was quarried at 27 operations in 10 counties. The leading producing counties were Northampton, Chester, and Bucks. The unit value of dimension stone was nearly $75 in 1978. Uses were for home and commercial construction. Major producers were Delaware Quarries, A. Dalley & Sons, Inc., Clan Bldg. Corp., and Media Quarry Co.

Table 9.—Pennsylvania: Dimension stone[1] sold or used by producers, by use

Use	1977			1978			1979		
	Short tons	Cubic feet (thousands)	Value (thousands)	Short tons	Cubic feet (thousands)	Value (thousands)	Short tons	Cubic feet (thousands)	Value (thousands)
Rough stone:									
Rough blocks	--	--	--	269	3	$20	--	--	--
Irregular-shaped stone	18,790	241	$373	17,364	223	367	21,199	271	$535
Rubble	r1,749	22	19	6,038	77	127	1,831	23	23
Monumental	3,583	43	439	3,621	36	394	W	W	W
Flagging	1,494	19	48	2,799	36	98	1,785	23	66
Dressed stone:									
Cut	W	W	W	W	W	W	16,946	13	690
Flagging	10,704	124	569	9,126	104	471	9,098	104	553
Roofing slate (standard)	4,856	53	912	2,774	31	667	2,789	31	721
Structural and sanitary	4,520	50	1,633	4,113	45	1,645	4,653	51	2,053
Blackboards	134	1	107	215	2	51	146	2	58
Billiard table tops	r2,090	23	451	844	9	238	W	W	W
Flooring slate	r1,565	r17	r197	497	5	133	641	7	133
Other uses[2]	16,394	201	614	22,272	269	1,004	17,558	189	1,128
Total[3]	65,879	794	5,362	69,932	841	5,215	76,646	714	5,961

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Other uses."

[1]Includes granite, sandstone, slate, and other stone.

[2]Includes stone used in dressed construction, electrical fixtures (1977-78), unspecified uses, and uses indicated by symbol W.

[3]Data may not add to totals shown because of independent rounding.

Table 10.—Pennsylvania: Crushed stone[1] sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1977		1978		1979	
	Quantity	Value	Quantity	Value	Quantity	Value
Agricultural limestone	1,550	7,541	1,497	8,282	1,728	10,028
Agricultural marl and other soil conditioners	--	--	--	--	110	763
Poultry grit and mineral food	58	W	W	W	W	W
Concrete aggregate	r5,499	13,765	5,258	14,442	5,409	17,232
Bituminous aggregate	6,462	17,296	6,543	19,117	6,057	19,520
Macadam aggregate	1,389	3,175	1,539	3,944	1,692	4,991
Dense-graded roadbase stone	14,704	35,849	15,077	39,545	13,737	40,445
Surface treatment aggregate	2,784	6,875	2,568	6,652	2,878	9,003
Other construction aggregate and roadstone	12,283	27,533	14,621	36,264	17,732	50,981
Riprap and jetty stone	984	2,460	922	2,522	922	3,005
Railroad ballast	1,630	4,646	1,473	4,111	1,589	5,097
Filter stone	372	1,119	477	1,604	545	2,065
Manufactured fine aggregate (stone sand)	859	2,835	1,310	4,339	1,561	5,752
Terrazzo and exposed aggregate	157	598	W	W	231	956
Cement manufacture	8,035	15,590	9,125	19,196	9,485	20,556
Lime manufacture	r2,975	r8,877	3,217	10,427	3,259	10,854
Dead-burned dolomite	W	W	W	W	438	1,972
Flux stone	2,306	8,026	2,767	11,075	2,955	12,199
Refractory stone	40	436	527	3,079	72	1,262
Abrasives	W	W	37	310	W	W
Mine dusting	127	1,233	126	1,296	131	1,683
Asphalt filler	117	777	68	454	108	636
Other fillers or extenders	102	1,463	202	2,342	147	2,073

See footnotes at end of table.

Table 10.—Pennsylvania: Crushed stone[1] sold or used by producers, by use —Continued

(Thousand short tons and thousand dollars)

Use	1977		1978		1979	
	Quantity	Value	Quantity	Value	Quantity	Value
Building products	30	W	133	315	124	334
Acid neutralization	9	W	--	--	--	--
Glass manufacture	W	W	101	843	W	W
Other uses[2]	r1,049	r3,557	1,453	4,358	819	3,503
Total[3]	63,522	163,652	69,041	194,518	71,730	224,908

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Other uses."

[1]Includes limestone, granite, sandstone, traprock, and other stone.

[2]Includes whiting or whiting substitute, (1977-78), roofing granules, (1978-79), fill, waste material (1977), chemical stone for alkali work (1979), unspecified uses, and uses indicated by symbol W.

[3]Data may not add to totals shown because of independent rounding.

Sulfur.—Three petroleum refineries in Philadelphia and Delaware Counties and one steel company in Allegheny County produced elemental sulfur in 1978 and 1979. Production during the 2-year period totaled 144,519 long tons valued at more than of $6 million.

Elemental sulfur was produced in the desulfurization of refinery gases. A lesser amount was produced in the treatment of natural gas. Principal uses were in the manufacture of sulfuric acid for fertilizers, in the leaching of ores, and in chemicals, fibers, paints, and explosives.

Tripoli.—Keystone Filler & Manufacturing Co.'s Sheddy mine in Northumberland County produced tripoli, which was used as an abrasive and filler.

Vermiculite (Exfoliated).—Crude vermiculite shipped into the State was exfoliated by J. P. Austin, Inc., Hyzer & Lewellen, Inc., and W. R. Grace & Co., located in Allegheny, Bucks, and Lawrence Counties, respectively. Major uses were for lightweight concrete aggregate, loose-fill insulation, horticultural purposes, and soil conditioning.

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Abrasives (Manufactured).—Manufactured abrasives, consisting of steel shot and grit, were produced by Durasteel Abrasive Co., in Westmoreland County; and Carborundum Co. and Ervin Industries, both in Butler County. Silicon carbide, another manufactured abrasive, was produced by Satellite Alloy Corp., Allegheny County. The finished products were used as abrasives and in refractories.

Cadmium.—In 1978, Pennsylvania ranked first nationally in the smelter production of cadmium. The primary producer of cadmium was New Jersey Zinc Co. in Lehigh County. Production averaged about 7 pounds per ton of slab zinc produced. Cadmium was used for electroplating, plastic stabilizers, and pigments.

Iron Ore.—Bethlehem Steel Corp.'s Grace mine, located near Morgantown in Berks County, remained closed in 1978 and 1979. The mine was closed in 1977, idling approximately 850 workers.

Iron Oxide Pigments.—Pfizer, Inc., and Reichard-Coulston, Inc., both in Northampton County, produced natural and synthetic oxides. Natural oxides were also produced by the Prince Manufacturing Co., Carbon County; Foote Mineral Co., Chester County; and Chemalloy Co., Inc., Montgomery County.

The production of natural and synthetic iron oxide pigments in 1979, excluding regenerator oxides, totaled 34,000 short tons valued at $24 million, reflecting a slight increase over those of 1978. Regenerator oxides were produced from steel plant dust.

Iron oxide pigments were used in paints, rubber products, plastics, concrete products, paper, magnetic ink, and fertilizers.

Iron and Steel.—In 1979, shipments of pig iron totaled slightly more than 19 million short tons valued at more than $3.6 billion, representing a slight increase over shipments in 1978. In December 1979, 28 blast furnaces were active and 16 were idle. In December 1975, there had been a total of 50 blast furnaces—25 operating and 25 idle.

Basic pig iron accounted for 86% of total blast furnace production in 1978 and 92% of the total in 1979. Types of pig iron produced were foundry, bessemer, malleable, and direct castings.

Zinc.—Pennsylvania ranked fifth nationally in zinc production in 1979, producing 21,447 metric tons valued at $17.6 million. These figures reflected an increase of 12% in quantity and 35% in value, over those of 1978. In 1979, the unit price of zinc was 37 cents per pound. Zinc was used mainly for galvanizing, brass and brass products, castings, paints, and chemical products. Lehigh

County, located in the eastern part of the State, was the only county in which zinc was produced. In western Pennsylvania, St. Joe Minerals Corp., located in Monaca, Beaver County, closed its zinc smelter in late 1979. The company had no plans for reopening the operation.

[1]State mineral specialist, Bureau of Mines, Pittsburgh, Pa.

Table 11.—Principal producers

Commodity and company	Address	Type of activity	County
Abrasives: Satellite Alloy Corp	Satellite Industrial Park Box 171 Springdale, PA 15144	Plant	Allegheny.
Cement:			
Amcord, Inc.[1]	610 Newport Center Dr. Newport Beach, CA 92660	do	Northampton.
Coplay Cement Manufacturing Co.[1]	Nazareth, PA 18064	do	Lehigh and Northampton.
Keystone Portland Cement Co.[1]	Box 1785 Allentown, PA 18105	do	Northampton.
Louisville Cement Co	501 South 2d St. Louisville, KY 40202	do	Lawrence.
Medusa Corp.[1 2]	Box 5668 Cleveland, OH 44101	do	Lawrence and York.
Penn-Dixie Industries, Inc.[1 2]	60 East 42d St. New York, NY 10017	do	Butler and Northampton.
United States Steel Corp.[1]	600 Grant St. Pittsburgh, PA 15230	do	Allegheny and Northampton.
Clays:			
Dresser Industries, Inc	Box 6504 Houston, TX 77005	Pit	Clearfield and Somerset.
Glen-Gery Corp	227 North 5th St. Reading, PA 19601	Pit	Adams, Berks, Northumberland, Union, York.
Hanley Co	28 Kennedy St. Bradford, PA 16701	Pit	Jefferson and McKean.
Resco Products	Box 108 Morristown, PA 19404	Pit	Clearfield and Huntingdon.
Graphite, synthetic:			
Airco Speer Carbon	800 Theresia St. St. Marys, PA 15857	Plant	Elk.
Charles Pfizer & Co., Inc	235 East 42d St. New York, NY 10017	do	Northampton.
Stackpole Carbon Co	St. Marys, PA 15857	do	Elk.
Gypsum, calcined: United States Gypsum Co.[3]	101 South Wacker Dr. Chicago, IL 60606	do	Philadelphia.
Iron oxide pigments:			
The Prince Manufacturing Co	Bowmanstown, PA 18030	do	Carbon.
Reichard-Coulston, Inc	15 East 26th St. New York, NY 10010	do	Northampton.
Lime:			
The J. E. Baker Co.[1]	Box 1189 York, PA 17405	do	York.
Mercer Lime & Stone Co	1640 Oliver Bldg. Pittsburgh, PA 15222	do	Butler.
Peat:			
Lake Benton Peat Moss	1418 North Main St. Scranton, PA 18508	Bog	Lackawanna.
Perlite, expanded:			
Armstrong Cork Co	Lancaster, PA 17603	Plant	Lancaster.
Pennsylvania Perlite Corp	Box 2002 Lehigh Valley, PA 18001	do	Lehigh and York.
Perlite Manufacturing Co	Box 478 Carnegie, PA 15106	do	Allegheny.
Sand and gravel:			
Davison Sand & Gravel Co	3d Ave. and 4th St. New Kensington, PA 15068	Dredge	Westmoreland.
Dravo Corp	One Oliver Plaza Pittsburgh, PA 15222	do	Beaver.
Erie Sand Steamship Co	Erie, PA 16500	do	Erie.
Shippingport Sand & Gravel Co	1200 Stambaugh Bldg. Youngstown, OH 44503	Pit	Armstrong.
Warner Co.[1 4 5]	1721 Arch St. Philadelphia, PA 19103	Pit	Bucks.
Slag:			
Bethlehem Mines Corp.[1 4]	701 East 3d St. Bethlehem, PA 18016	Plant	Cambria.
Dunbar Slag Co	Box 666 Sharon, PA 16146	do	Mercer.

See footnotes at end of table.

Table 11.—Principal producers —Continued

Commodity and company	Address	Type of activity	County
Slag —Continued			
Standard Slag Co	1200 Stambaugh Bldg. Youngstown, OH 44503	Plant	Cambria.
Stone:			
G. & W. H. Corson, Inc.[4]	Plymouth Meeting, PA 19462	Quarry	Montgomery.
The General Crushed Stone Co	712 Drake Bldg. Easton, PA 18042	do	Bucks, Chester, Delaware, Lancaster, Luzerne, Perry.
Glasgow Quarry, Inc	Route 2, Box 121 Glasgow, MO 65254	do	Montgomery.
Martin-Marietta Corp	11300 Rockville Pike Rockville, MD 20852	do	Centre, Chester, Fayette, Northampton.
New Enterprise Stone & Lime Co., Inc	New Enterprise, PA 16664	do	Bedford, Blair, Cumberland, Franklin, Huntingdon, Somerset.
Sulfur:			
Atlantic Richfield Co	3144 Passyunk Ave. Philadelphia, PA 19145	Plant	Philadelphia.
British Petroleum Corp., Ltd	Box 428 Marcus Hook, PA 19061	do	Delaware.
Gulf Oil Corp	Box 7408 Philadelphia, PA 19101	do	Philadelphia.
Tripoli:			
Keystone Filler & Manufacturing Co	Muncy, PA 17756	Pit	Lycoming.
Vermiculite, exfoliated:			
Hyzer & Lewellen, Inc	Box 155 Southampton, PA 18966	Plant	Bucks.
W. R. Grace & Co	62 Whittemore Ave. Cambridge, MA 02140	do	Lawrence.

[1]Also stone.
[2]Also clays.
[3]Also expanded perlite.
[4]Also lime.
[5]Also slag.

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